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What's New in Allergy Diagnostic Testing?

### HOT TOPICS IN ALLERGY - WHAT'S NEW IN ALLERGY DIAGNOSTIC TESTING

You are listening to ReachMD, The Channel For Medical Professionals. Welcome to Hot Topics in Allergy presented by the American College of Allergy, Asthma, and Immunology. Your host is Dr. Ketan Sheth, Medical Director of the Lafayette Allergy and Asthma Clinic in Lafayette, Indiana.

Are prick and patch allergy tests still considered effective or have other testing methods emerged as better indicators of allergy. Joining us to discuss what's new in allergy diagnostic testing Joint Task Force Practice Parameters is Dr. I. Leonard Bernstein, Co-Director of the Allergy Research Laboratory in the Department of Medicine at the University of Cincinnati Medical Center. Dr. Bernstein was co-author of the joint task forces parameters.

**DR. KETAN SHETH:**

Welcome Dr. Bernstein.

**DR. I. LEONARD BERNSTEIN:**

Yes, thank you.

**DR. KETAN SHETH:**

Well, how were the allergy diagnostic parameters developed?

**DR. I. LEONARD BERNSTEIN:**

Well actually this a third upgrade of the parameters. It started in 1987, I chaired a NIH consensus conference on the new technologies that were beginning to appear at that time and we published the first version of the allergy diagnostic guidelines so to speak in 1988 and as a result of that, the 3 major allergy organizations invited me to actually become a member of the joint task force and practice parameters and since that time, we have developed 2 additional updates of allergy diagnostic testing, the last one published in 1995 and a most recent one this year (01:30).

**DR. KETAN SHETH:**

What were the goals of developing the parameters?

**DR. I. LEONARD BERNSTEIN:**

The main goal was essentially to ensure quality for our patients and of course to educate if need be, members of our society and members of profession at large as to the proper way to use testing and interpret testing for the benefit of patients.

**DR. KETAN SHETH:**

Are there common misconceptions about allergy diagnostic testing that these parameters are attempting to correct?

**DR. I. LEONARD BERNSTEIN:**

Yes, I think there are many misconceptions. One of the chief misconceptions I think is that we try to correct as if many doctors, even many allergists have thought that allergy skin testing can be directly correlated with clinical allergy and that is not true. Clinical allergy means that you have the symptoms and we can show that you have the symptoms by doing provocation testing or placing you in an environment where you are exposed to certain allergens and that is what we mean by clinical allergy, but some people think, have thought that just doing a skin test or even an in-vitro test directly correlates with that condition of clinical allergy. So in other words, we differentiate between lets say skin-test positive patients and patients with clinical allergy, or we differentiate between patients with a positive in-vitro test and allergy. So you really have to show that there is a positive predictive value or positive likelihood that your test will, in fact, confirm the fact that you have clinical allergy.

**DR. KETAN SHETH:**

Are there some other misconceptions that you are working on for these (03:00) parameters you are trying to help us with?

**DR. I. LEONARD BERNSTEIN:**

Well I mean, one of the things that we tried to establish here is that for example with prick testing, that you have to realize that there are many different devices that are being used with prick testing. Some of the devices aren't as good as others. Some of them are too traumatic and therefore make it difficult to interpret. Some people don't use proper controls in doing the test. For example use of positive and negative control, otherwise you can't interpret them properly and the other thing that we try to emphasize with prick testing in particular is that you have to measure them and you have to record them in a standardized way, so that if a patient moves from let's say Cincinnati to Seattle, the doctor in Seattle will be able to know exactly how sensitive that patient was in terms of the actual size of the skin test and that is one of our goals of this particular task force.

**DR. KETAN SHETH:**

How effective are the prick tests for even the intracutaneous test?

**DR. I. LEONARD BERNSTEIN:**

Well the prick tests, generally speaking, of course they may vary from allergen to allergen. Some allergens are very potent. For example the specificity of cat allergen is very high and very \_\_\_\_\_ very well with clinical sensitivity, but the specificity and sensitivity of other allergens may vary a great deal. The pollens in general are pretty good, they correlate in terms of about 70% to 75%, sometimes in certain situations may be a little higher, but the sensitivity of mold allergens in prick testing may be less and so there is a certain hierarchy of sensitivity and even specificity among different allergens.

**DR. KETAN SHETH:**

Well may be we should really actually step back. You and I are both allergists obviously and we talk about this all the time, but do we mean by a prick test **(04:30)** or intracutaneous test?

**DR. I. LEONARD BERNSTEIN:**

Well a prick test, is we use sharp needle-like instrument and we simply just prick the outer layer of the skin very gently in such way as to not draw blood and then we place the allergen on top of that prick. Some people actually brush it off right away and some people brush it off after 15 minutes. We read the test in 15 to 20 minutes and we can really if it is a positive test, we see a wheal area or like a hive-like area that we can measure and we also see a small area of erythema around the wheal which we also measure. So we measure both the wheal and the erythema and both have a certain amount of significance. The intracutaneous test is done by injecting a small amount of material intracutaneously between the layers of the epidermis and the dermis. A very slight bleb, it shouldn't be anymore than 0.02 mL and then without drawing blood hopefully and then you wait about 10 or 15 minutes to read that. Of course you have to have a positive histamine control along with it and you have to have a negative saline control with it. In terms of reading a prick test, a prick test has to be at least few mm or above in terms of the negative saline control before it really can be considered positive and that is a very strict criteria and if we don't adhere to that, you know, you may just be reading the test incorrectly. Generally speaking, the prick tests are more specific than the intracutaneous tests. The intracutaneous tests are more sensitive and in fact the intracutaneous tests are good for certain things. **(06:00)** They are very good for diagnosis of insect venom allergy. The type of allergy that causes anaphylaxis and they are very good for diagnosing penicillin allergy which can also result in anaphylaxis. We don't know why that there is a huge difference, but it certainly is something that we learn by experience, but on the other hand, the intracutaneous tests can be too sensitive for many things. We certainly we don't think they should be used for the diagnosis of food allergy, because they are simply too sensitive and sometimes they can be very irritative. The reason that we have a problem with the intracutaneous tests, are because people have used it at one concentration, lets say 1 to 1000 weight by volume, whereas we know from many studies now that the proper interpretation of intracutaneous test requires a type of stepwise threshold testing that is testing to various dilutions, starting with small levels to higher levels. So that is how it works the best.

**DR. KETAN SHETH:**

If you are just tuning in, you are listening to Hot Topics in Allergy on ReachMD, The Channel For Medical Professionals. I am your host, Dr. Ketan Sheth, and joining me to discuss what's new in allergy diagnostic testing joint task force practice parameters is Dr. I. Leonard Bernstein, Co-Director of the Allergy Research Laboratory at the University of Cincinnati Medical Center.

Now one of the other types of allergy test is obviously the patch test for contact dermatitis, is the TRUE test effective.

**DR. I. LEONARD BERNSTEIN:**

Yes the TRUE test is (07:30) some of the most common allergens that cause contact dermatitis. Contact dermatitis is a type rash, reddened, raised rash that people get after becoming allergic to things they come in contact with. For example, 10% of all women have nickel allergy by wearing some costume jewelry especially for earrings and bracelets and necklaces, they may develop allergy to the nickel metal and that can last for decades. So in fact, for the rest of their lives sometimes. This could be very troublesome and we also have to worry about various metals that are used in prosthetic devices such as knees and hips and rods that are used for scoliosis and that sort of thing. Because these alloys tend to leach out of these materials, so having a good test for these potentially very serious problems is a very important thing for allergists. Allergist incidentally I think do as much patch testing as dermatologists do these days because they have a you know, great interest in the area of delayed hypersensitivity which contact dermatitis represents. The TRUE test itself tests for the most common materials that cause contact dermatitis. Unfortunately it isn't as complete as a North American Contact Dermatitis Test Panel developed by dermatologists, that includes about 65 reagents altogether, but these are well known to all allergists and actually the TRUE test could be easily expanded depending on the history that the patient presented (09:00) in terms of what they came in contact with, but it is a very effective test. It has to be read not immediately, but 48 hours later. It is quite different than the prick test because it measures a different kind of immune reaction, it is called delayed hypersensitivity, that's why we read it in a delayed way. You read it at 48 hours and many people insist that including me that you should also read it at 96 hours because some allergens don't show up until that time and in fact, there are a few weakly-reacting allergens that don't show up for as long as 1 week. So we even sometimes take the reading even further, but once you have a positive reading, that fully establishes the diagnosis and in fact, if one wants to one can even correlate this with some in-vitro test to cell mediated immunity.

**DR. KETAN SHETH:**

Well what other sorts of in-vitro tests are available?

**DR. I. LEONARD BERNSTEIN:**

Well for IgE allergic reactions, we call them IgE because IgE is the name given to the allergic antibody that was first discovered by a Japanese team by the name of Ishizaka. So now we really know what the allergic antibody actually is and the tests that we do are all IgE mediated type of tests and in 1967 a group in Sweden developed an in-vitro test which at the time was called a RAST test. Since that time, the test has been further refined and is now available in several different companies, one is called an ImmunoCAP and one is called Immulite (10:30) and it does measure quantitatively the amount of specific IgE or allergic antibody in the serum. Just as the prick test though it has to be done in a careful way. It has to be done with the proper type of controls. What we like to see is that it is done with an allergen that is the same you are looking for. For example, if we are looking to see whether the patient was allergic to ragweed, we certainly want to include a known ragweed control in the in-vitro test and there should be a negative control as well. So one of the problems with the in-vitro tests or potential problems is you really have to know the quality of the tests run by the specific company that you are sending the blood to. Because quality is all important in this test and the only way you can be assured of quality is to really find out if the company is sending this specimen in a regular manner to the American College Pathology Survey of Blood Tests which they do specifically for this in-vitro test. The in-vitro test is not quite as sensitive as the prick test. So therefore most allergists will prefer to do the prick test first. However, except for in certain situations it is very helpful. For example, if the patient has a skin disease where you can't test or the patient has had the antihistamines which would interfere with the prick test. This would be a very good alternative provided that it is interpreted properly, provided that the test is done (12:00) properly and with the controls as I have mentioned.

**DR. KETAN SHETH:**

I would like to thank my guest from the University of Cincinnati Medical Center, Dr. I. Leonard Bernstein. Dr. Bernstein thank you for being our guest this week on Hot Topics in Allergy.

**DR. I. LEONARD BERNSTEIN:**

It was my pleasure.

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